TRIGONOMETRICAL FUNCTION

FULL DETAILS STUDY

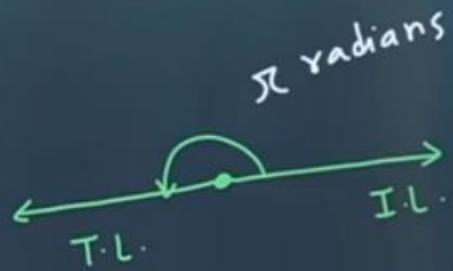
Degree measurement

Straight Angle $= 180^\circ$

$$180^\circ = \pi^c$$

$$1^\circ = \left(\frac{\pi}{180}\right)^c \quad \& \quad 1^c = \frac{180^\circ}{\pi}$$

Radian measurement

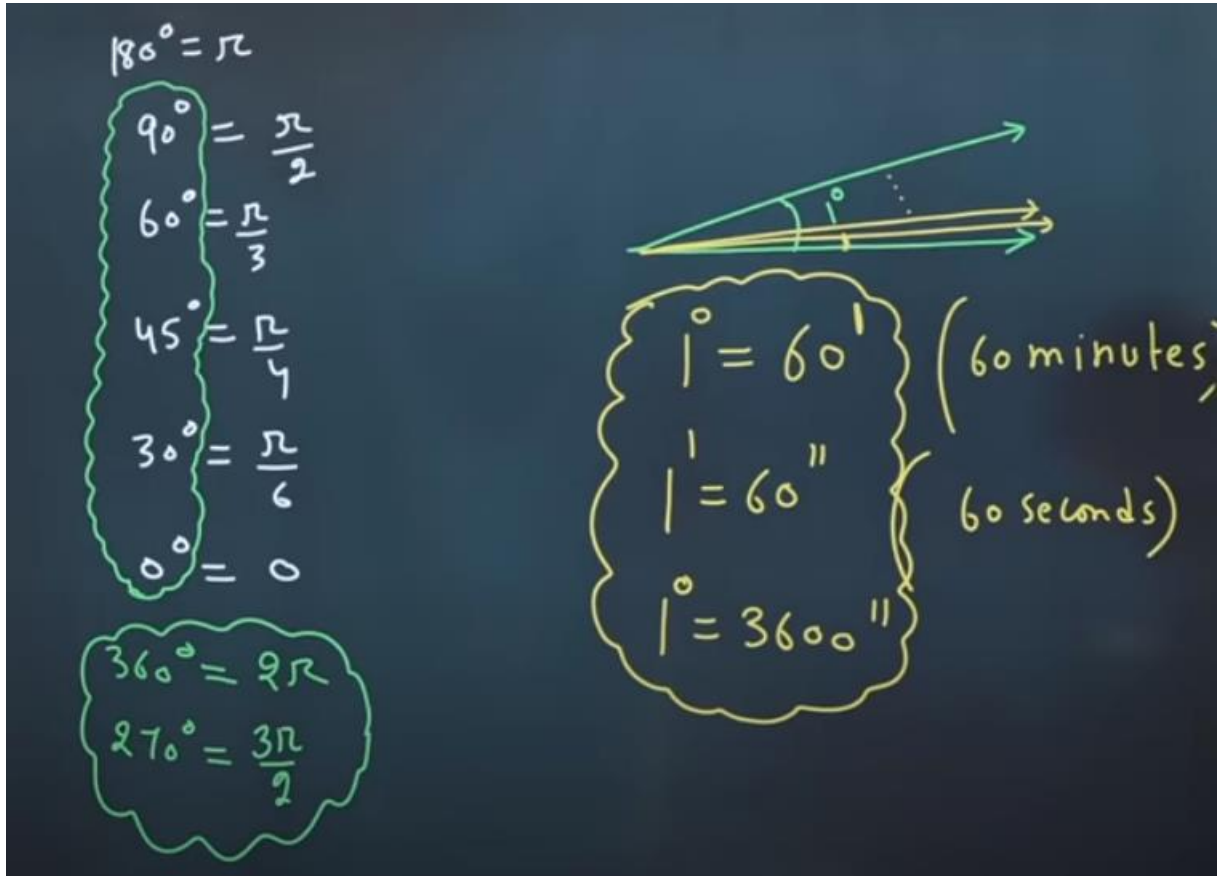


Straight Angle $= \pi$ radians

$= \pi^c$

or

π


180° = π
90° = π/2
60° = π/3
45° = π/4
30° = π/6
0° = 0
360° = 2π
270° = 3π/2
1°
1° = 60'
1' = 60"
1° = 3600"
(60 minutes)
(60 seconds)

Q. $20^\circ 30'$

Convert into Radian.

$60' = 1$

$30' = \frac{1}{2}^\circ$

Solution:- $20^\circ 30' = 20^\circ + 30'$

$= 20^\circ + \frac{1}{2}^\circ$

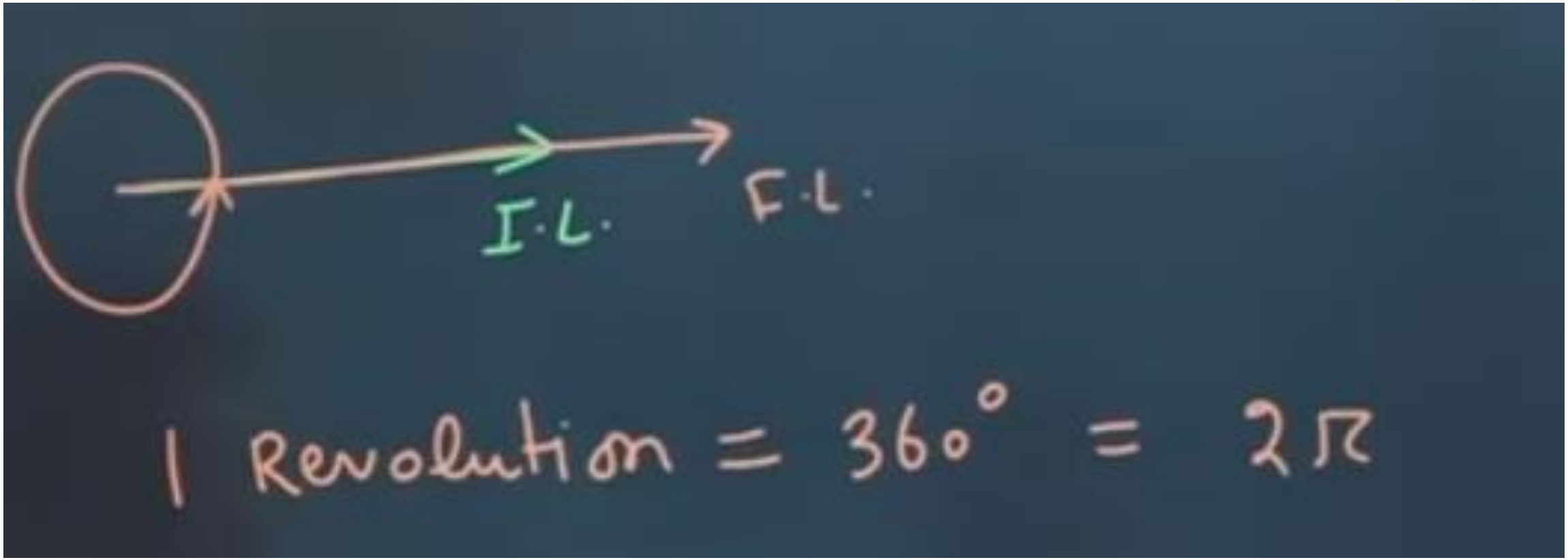
$= \left(\frac{40+1}{2}\right)^\circ = \left(\frac{41}{2}\right)^\circ$

$180^\circ = \pi$

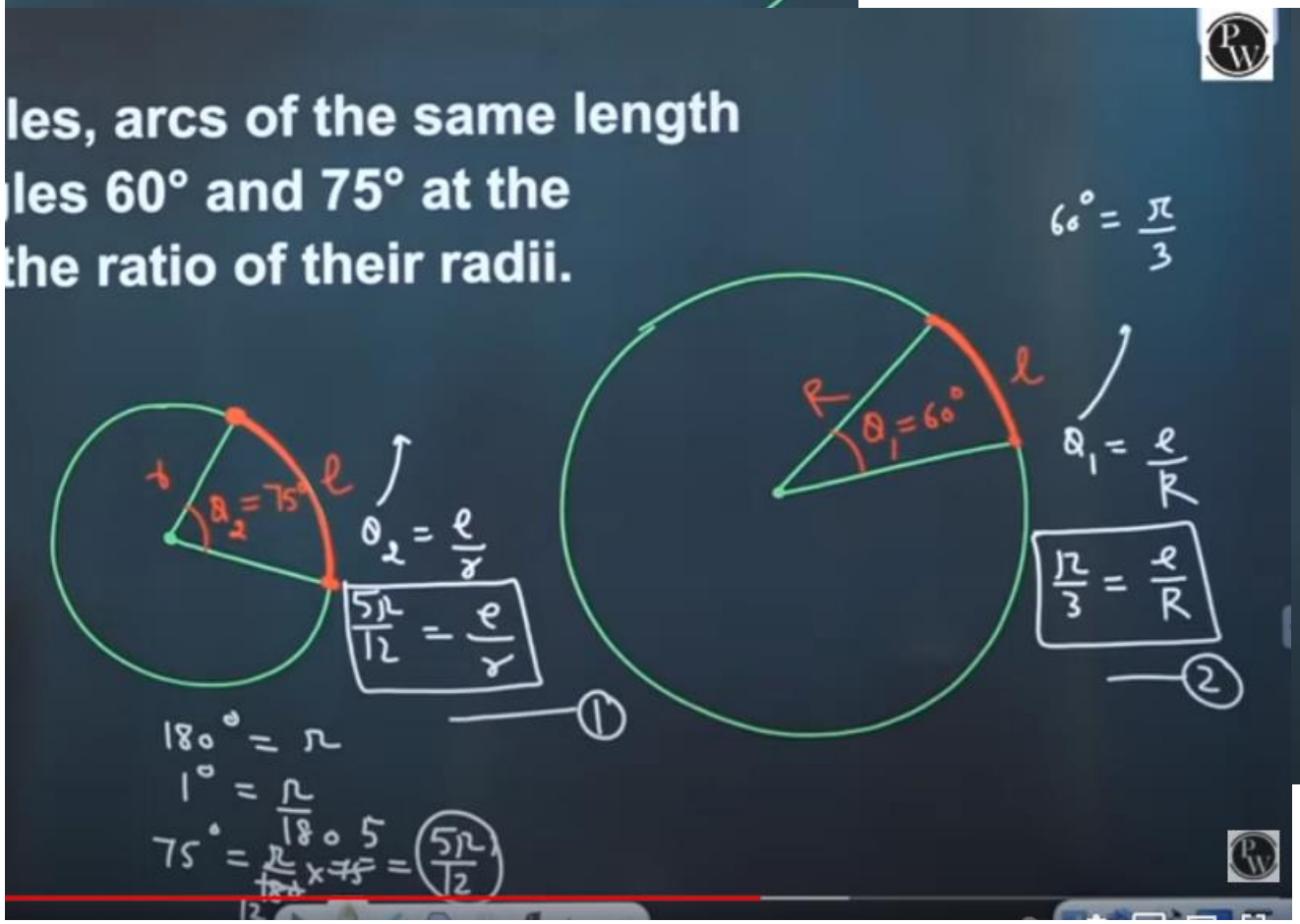
$1^\circ = \frac{\pi}{180}$

$\left(\frac{41}{2}\right)^\circ = \frac{\pi}{180} \times \frac{41}{2} = \frac{41\pi}{360}$

$20^\circ 30' = \frac{41\pi}{360}$


I.L.
F.L.
1 Revolution = 360° = 2π

If in two circles, arcs of the same length subtend angles 60° and 75° at the centre, find the ratio of their radii.

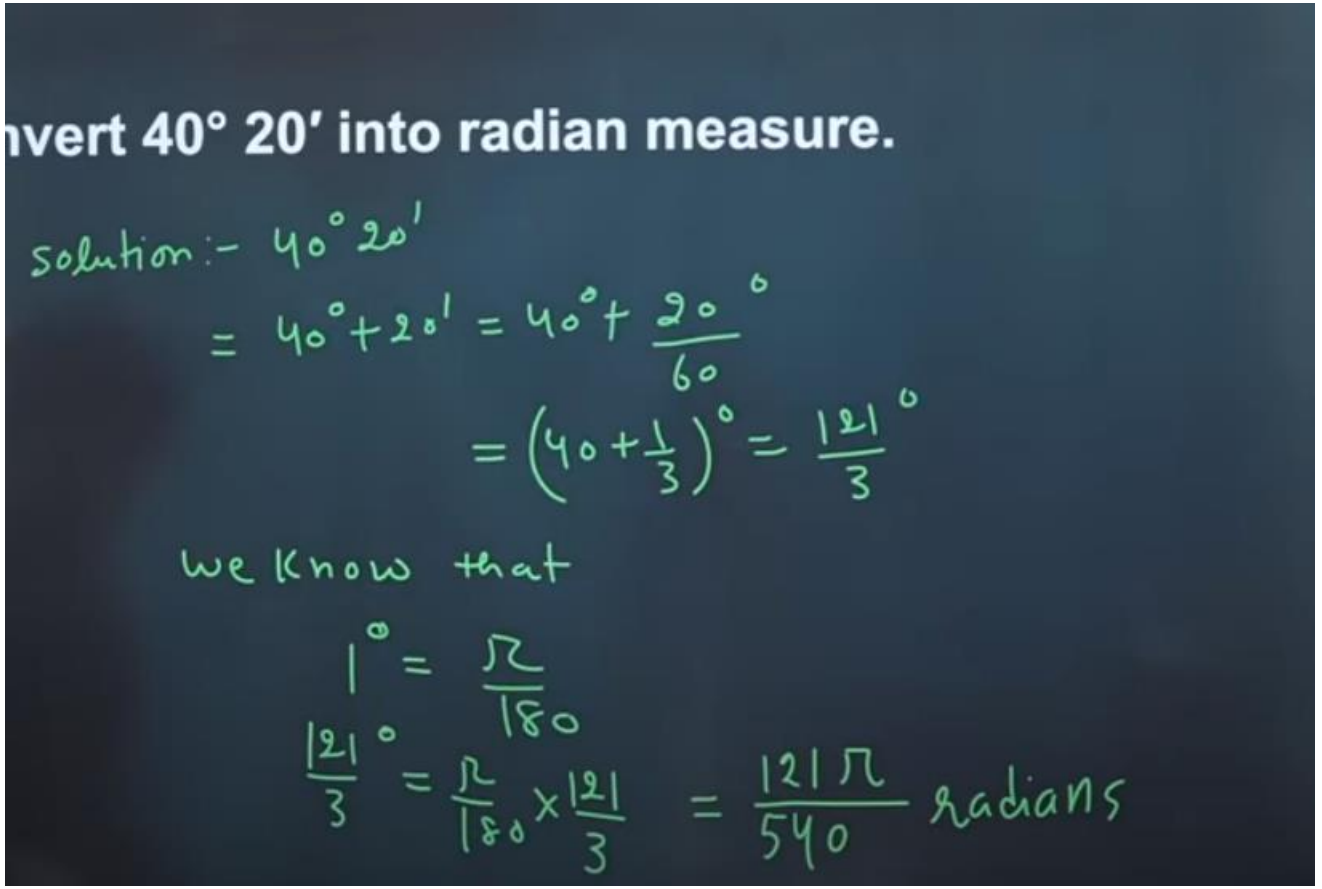


Divide equation ① and ②

$$\frac{\frac{5\pi}{12}}{\frac{\pi}{3}} = \frac{\frac{\ell}{r}}{\frac{\ell}{R}}$$

$$\frac{5}{4} \times \frac{3}{1} = \frac{R}{r}$$

$$R : r = 5 : 4$$


nvert 40° 20′ into radian measure.
solution:- 40° 20′
= 40° + 20′ = 40° + 20°/60
= (40 + 1/3)° = 121/3 °
we know that
1° = π/180
121/3 ° = π/180 × 121/3 = 121π/540 radians

Advanced Identities (For JEE)

$$\sec^2\theta \cdot \operatorname{cosec}^2\theta = \sec^2\theta + \operatorname{cosec}^2\theta$$

$$\tan^2\theta \cdot \sin^2\theta = \tan^2\theta - \sin^2\theta$$

$$\cot^2\theta \cdot \cos^2\theta = \cot^2\theta - \cos^2\theta$$

$$\text{L.H.S.} = \sec^2\theta \cdot \operatorname{cosec}^2\theta = \frac{1}{\cos^2\theta \cdot \sin^2\theta}$$

$$= \frac{\cancel{\sin^2\theta} + \cancel{\cos^2\theta}}{\cancel{\cos^2\theta \cdot \sin^2\theta}} \quad \cancel{\cos^2\theta \cdot \sin^2\theta} = \sec^2\theta + \operatorname{cosec}^2\theta$$